

*FORMAD (H.F.)*

**SPECIAL EDITION**

OF SEVENTY-FOUR PLATES, ILLUSTRATING THE HISTOLOGY OF

**TUMORS,**

EXTRACTED FROM

**A MANUAL**

OF

**MICROSCOPIC DIAGNOSIS.**

BY

**H. F. FORMAD, B.M., M.D.,**

INSTRUCTOR IN MICROSCOPY AND PATHOLOGY (POST-GRADUATE COURSE), LECTURER ON EXPERIMENTAL PATHOLOGY AND DEMONSTRATOR OF MORBID ANATOMY IN THE UNIVERSITY OF PENNSYLVANIA, MUTTER LECTURER IN THE COLLEGE OF PHYSICIANS OF PHILADELPHIA, LECTURER ON MYCOLOGY IN THE FRANKLIN INSTITUTE, MICROSCOPIST TO THE PHILADELPHIA HOSPITAL, CURATOR TO THE UNIVERSITY HOSPITAL, ETC.

ILLUSTRATED WITH TWO HUNDRED ORIGINAL ENGRAVINGS

BY **I. W. BLACKBURN, M.D.**



PHILADELPHIA:

**J. B. LIPPINCOTT & CO.**

1883.

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# PREFACE

(TO SPECIAL EDITION).

THE following pages represent the illustrations of the histology of tumors intended for my "MANUAL OF MICROSCOPIC DIAGNOSIS," as announced on the title-page. This Manual will be published about June 1st.

The present speelial edition is not intended to be put in book-sale. It was printed with these objects: 1st, to test the efficiency of the photo-engravings prepared from the drawings of my collaborator, Dr. I. W. Blackburn; 2d, to utilize them in the laboratory instruction of the present Spring term;\* and, 3d, to liberate the plates for the use of Prof. D. Hayes Agnew. Prof. Agnew has honored us by selecting from the plates contained in this edition the illustrations of the histology of tumors for the forthcoming third volume of his *Surgery*. Most of these illustrations were drawn from sections of tumors obtained from cases of the University Hospital service of Prof. Agnew, and partly from those of Prof. John Ashurst, Jr., as well as Drs. Charles T. Hunter and J. William White; partly also from cases of Prof. Agnew's private practice.

A word concerning my forthcoming "Manual of Microscopic Diagnosis" will not be out of place here.

The Manual was prepared at the repeated request of the medical classes of the University of Pennsylvania and that of my professional friends who, during the last six years, honored my laboratory by taking instruction in pathology. The volume will comprise an illustrated outline of my course and methods in microscopical diagnosis, embracing both normal and pathological structures. It is not intended to be a substitute for any one of the exhaustive, systematic text-books of histology or pathology, but is merely a manual for practical use in the laboratory and for the busy practitioner who desires concise information and good illustrations concerning pathological tissues and liquids, or for the student who wishes to review things already learned.

The material to be presented in the Manual has been gradually elaborated and selected during several years. The specimens were

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\* In my experience, good illustrations, side by side with the specimen under the microscope, are an efficient aid to the student, and also to the teacher, particularly when instructing large classes.

all prepared and studied by students of the University of Pennsylvania and by myself. A large number of specimens were prepared by my pupil and assistant, Dr. William Gray. Numerous attempts at drawings were made for years past, but it was not until I secured the collaboration of my friend and pupil, Dr. I. W. Blackburn, who, during the last two years, has studied with me every specimen drawn, that the artistic part of the Manual was brought into that condition of which the plates in this issue are rough proofs. These drawings, executed by Dr. Blackburn, are all original, and were made with the aid of the camera lucida and accurate measurements. They present the most common microscopic appearances of typical specimens. It will be noted that very high amplification, elaborate stainings, and injections of the preparations which were drawn have been avoided, for I consider them (except in very few instances) valueless for practical purposes of diagnosis. I have endeavored to represent only such appearances as every student in the laboratory or every practitioner can obtain from his own simple carmine or haematoxylin preparations, and with the limited means of amplification at his command.

The completed Manual will embrace a chapter on histogenesis, a brief consideration of the morphology of all normal and pathological tissues, and all the morbid substances and liquids which the practitioner is liable to meet with. A chapter will be devoted to bacteria. Careful consideration will be given to all sources of error in microscopical diagnosis.

All the subjects will be presented in accordance with our present state of knowledge and the most generally accepted views, omitting all historical and critical data. The synonymes, bibliographical references, and new views of importance will, however, be inserted in small print for the convenience of advanced students.

The Manual will be illustrated by two hundred engravings inserted in the text, and is not expected to exceed a volume of three hundred octavo pages. The engravings were made by the Photo-Engraving Company, New York City.

H. F. FORMAD.

UNIVERSITY OF PENNSYLVANIA, April, 1883.

# LIST OF ILLUSTRATIONS

REPRESENTING THE

## MICROSCOPICAL APPEARANCE OF TUMORS AND OF SOME ALLIED GROWTHS.

1. Lymphoma (soft).
2. Lymphoma, leukæmic.
3. Lymphoma (hard).
4. Granulation-tissue.
5. Sarcoma, small round-celled (granulation-like).
6. Sarcoma, lymph-adenoid round-celled.
7. Sarcoma, small spindle-celled.
8. Sarcoma, large spindle-celled.
9. Sarcoma, melanotic, spindle-celled.
10. Sarcoma, melanotic, round-celled.
11. Sarcoma, myeloid (giant-celled).
12. Sarcoma, alveolar round-celled.
13. Sarcoma, large-celled, round-celled.
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32. Fibroma (hard) from fascia.
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62. Carcinoma, hard.
63. Carcinoma, hard, atrophy.
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65. Carcinoma of uterus.
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70. Carcinomatous osteoma.
71. Epithelioma, cylindrical.
72. Epithelioma, tubular.
73. Epithelioma, squamous (low power).
74. Epithelioma, squamous (high power).

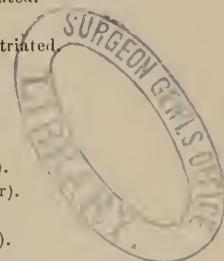
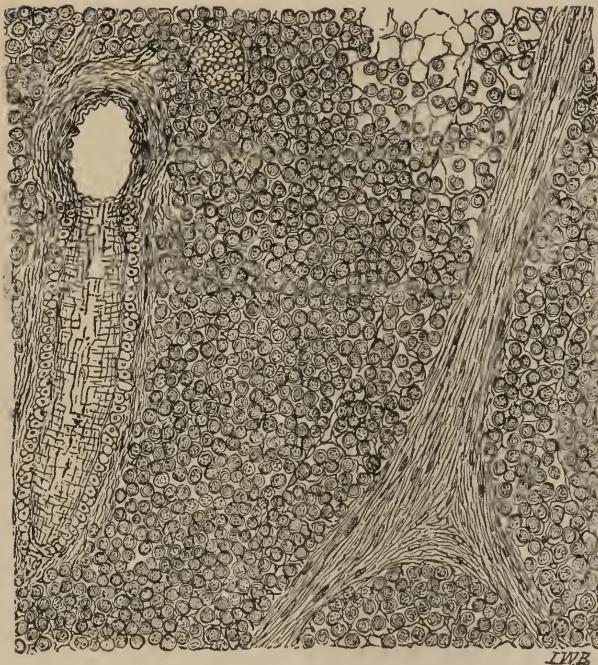




Fig. 1.

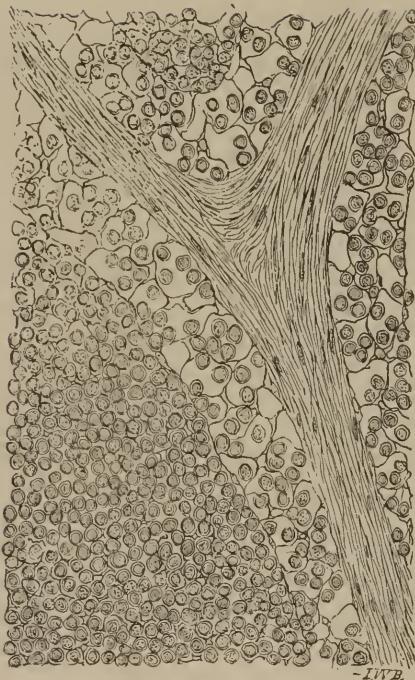


LYMPHOMA (Soft).

SYN., *Lymph-adenoma*.

The section represents the structure of one out of a number of hypertrophic lymphatic glands which formed a chain of tumors on one side of neck. Identical with normal lymphatic gland (only hypertrophic), but the lymph-sinuses indicated on both sides of the connective-tissue trabeculum (right side of cut) cannot more readily be freed of their lymphoid cells than the rest of the structure. The left side of the drawing shows a small artery cut both longitudinally and transversely, and above it a capillary vessel cut across and filled with corpuscles.  $\times 400$ .

Fig. 2.

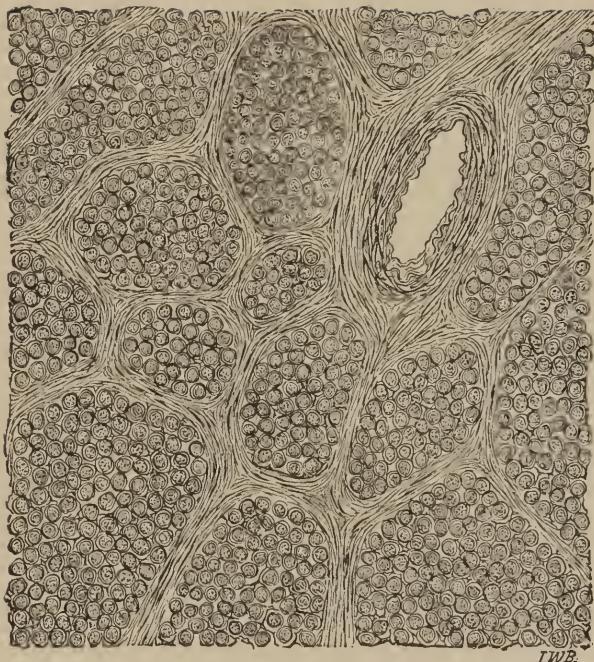


**LEUKÆMIC LYMPHOMA.**

SYN., *Leukæmic Lymph-adenoma.*

A uniform enlargement of all parts of the gland and of nearly all the lymphatic glands of the body. Histologically identical with normal lymphatic gland; lymph-sinuses are easily freed of the cells. The partly brushed-out lymph-sinuses are shown in the drawing.  $\times 400$ .

Fig. 3.



**LYMPHOMA (Hard).**

*SYN., Indurated Lymph-adenoma.*

The section represents the structure of one of three small, slow-growing tumors of one side of neck of man aged thirty-five, developed from lymphatic glands. A large amount of dense connective tissue, forming alveoli, surrounds small and larger masses of lymphoid cells. A transverse cut of a blood-vessel, with perfect muscular wall, is seen in the upper part of the drawing.

Fig. 4.



GRANULATION-TISSUE

FROM THE EDGE OF AN ULCER.

*Prototype of Sarcoma.*

The section was made perpendicularly through a part of a skin ulcer covering a large lipoma of thigh. Upper part of drawing represents the earlier stage of organizing tissue in the process of healing of ulcers, showing nucleated protoplasm with small round cells and giant-cells. These are seen transforming gradually into spindle-shaped and stellate cells, with an attempt at cicatrization. Capillary new-formed blood-vessels are seen in longitudinal and transverse cuts.

Fig. 5.

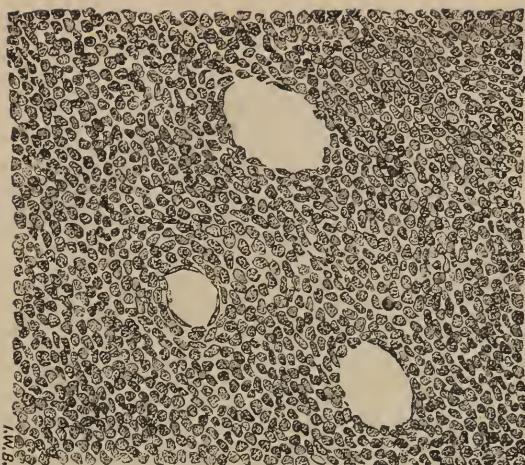
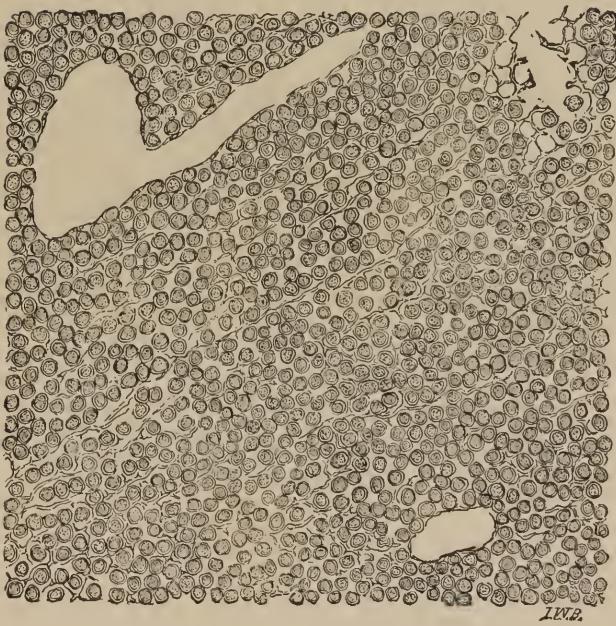


Fig. 6.



**ROUND-CELLED SARCOMA (Small-celled).**

Fig. 5. SMALL ROUND-CELLED (GRANULATION-LIKE) SARCOMA OF ORBIT. The cells are not perfectly round, and appear as mere nuclei, without any protoplasm around them. No attempt at connective-tissue formation can be observed in any true sarcoma.

Fig. 6. LYMPHO-ADENO ROUND-CELLED SARCOMA OF LYMPHATIC GLAND OF NECK. A delicate reticulum is seen between the perfectly round cells in some places, in others it is destroyed by cell-proliferation. The blood-vessels in all the sarcomata are mere channels, without muscular or distinct walls. Both figures show transverse cuts of vessels.

Fig. 7.

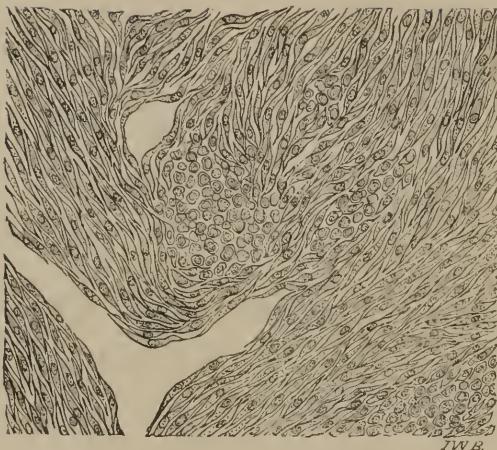


Fig. 8.



#### SPINDLE-CELL SARCOMA.

SYN., *Recurrent Fibroid.*

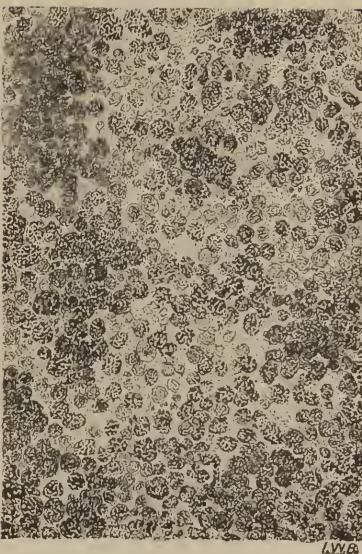
Fig. 7. SMALL SPINDLE-CELLED SARCOMA FROM TIBIA OF YOUNG MAN. The fusiform (spindle-shaped) cells of which these growths are exclusively made up are arranged in fasciculi which decussate in various directions. Some of the cells are cut transversely, and hence appear round. The blood-channels have no defined distribution or direction.  $\times 400$ .

Fig. 8. LARGE SPINDLE-CELLED SARCOMA FROM TUNICA VAGINALIS TESTIS OF BOY. Same as last-mentioned tumor, only cells larger.

Fig. 9.



Fig. 10.



#### MELANOTIC SARCOMA.

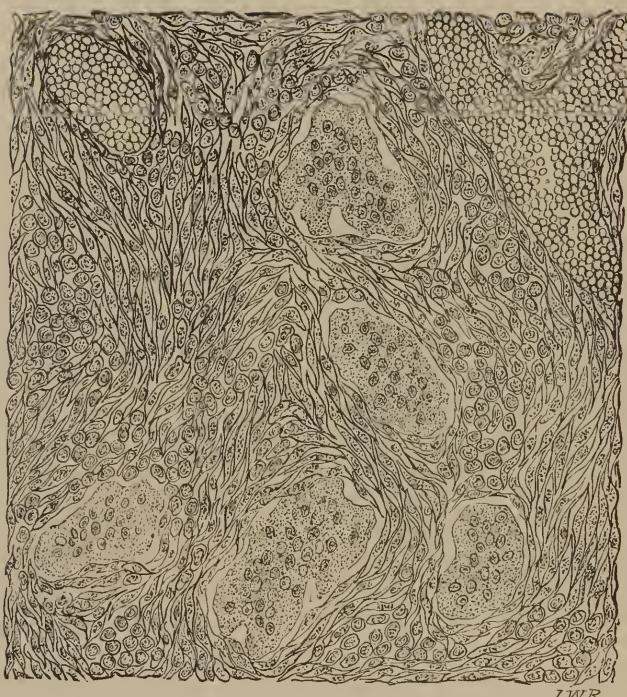
SYN., *Pigmented Sarcoma*.

Fig. 9. MELANOTIC SPINDLE-CELLED SARCOMA OF ORBIT.  $\times 400$ .

Fig. 10. MELANOTIC ROUND-CELLED SARCOMA OF SKIN.  $\times 400$ .

NOTE.—The melanotic alveolar sarcoma is the most common.

Fig. 11.

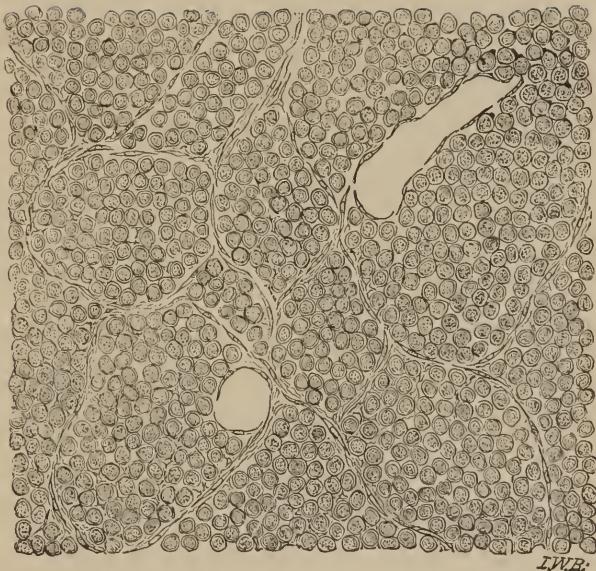


MYELOID SARCOMA.

SYN., *Giant-celled Sarcoma, Osteo-sarcoma.*

The section is taken from a rapidly-growing tumor (surrounded by a bony capsule) of knee-joint of young man. The bulk of tumor-tissue is made up of spindle-shaped cells. Five giant-cells and two blood-channels, the latter filled with blood-corpuses, are seen in the section.  $\times 400$ .

Fig. 12.



ALVEOLAR ROUND-CELLED SARCOMA.

From foot of young woman, originating in deep fascia. A very delicate connective-tissue framework, containing spindle-cells, is seen surrounding groups of lymphoid cells. The blood-vessels have no muscular walls.  $\times 400$ .

Fig. 13.



**LARGE-CELLED, ROUND-CELLED SARCOMA.**

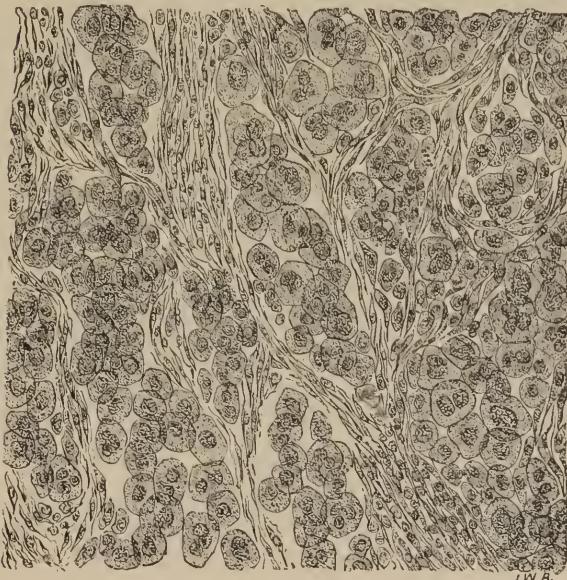
Syn., *Endothelial Carcinoma, Alveolar Sarcoma, Carcinomatous Sarcoma, Endothelioma, Encephaloid Sarcoma.*

The growth is from breast of middle-aged woman, developed from the connective-tissue elements (endothelium), the glandular elements proper being left intact. The cells are spherical, of epithelioid character, with large amount of hyaline protoplasm (represented striated in the drawing), and a likewise large nucleus with nucleolus. The cells measure up to  $\frac{1}{16}$  of an inch in diameter, and are embedded in an intercellular reticulum. They stand in intimate union with the remnants of a connective-tissue matrix, and are unquestionably of endothelial and not of epithelial origin. Hence the term *Alveolar Sarcoma* is an appropriate one. Preferably the term *Endothelial Carcinoma* might be used as contradistinctive from epithelial, or true carcinoma, with which this growth is identified by some pathologists.  $\times 400$ .

Fig. 14.



Fig. 15.



**ALVEOLAR SARCOMA (Large-celled).**

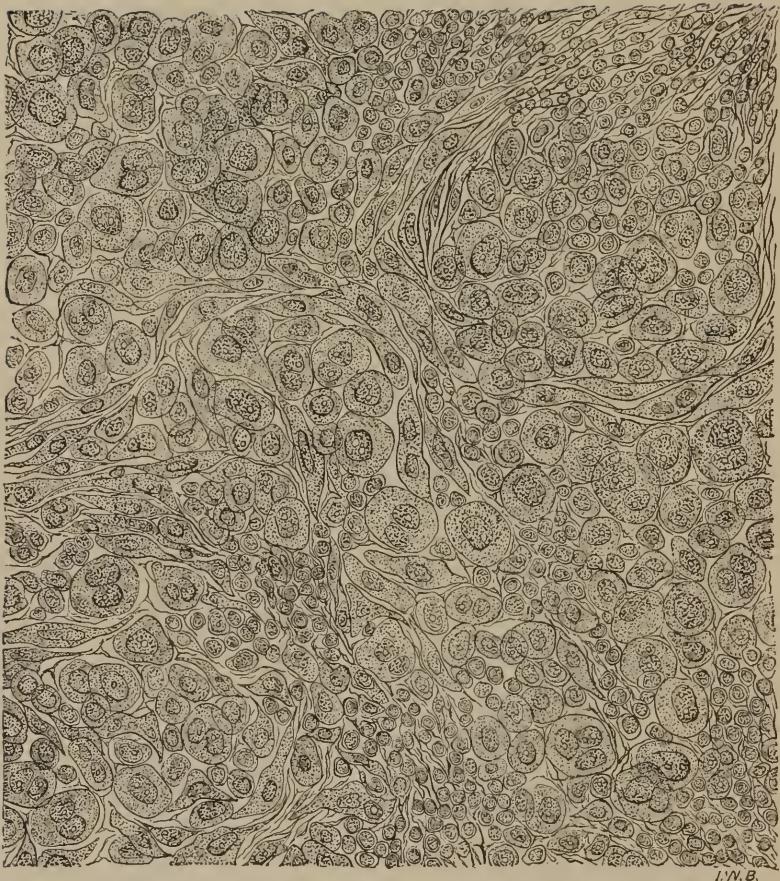
SYN., *Endothelial Carcinoma*.

The growth is from breast of middle-aged woman. The development is well represented in the two drawings.

Fig. 14, upper portion, shows an active proliferation of the endothelial cells of the connective-tissue lymph-spaces; farther down the cells are seen rapidly multiplying, and distend the lymph-spaces, which in section give the appearance of alveoli. The epithelial elements of the gland were unaltered.

Fig. 15 (from a more internal portion of same tumor) shows a further stage of development, simulating true (epithelial) cancer.  $\times 400$ .

Fig. 16.

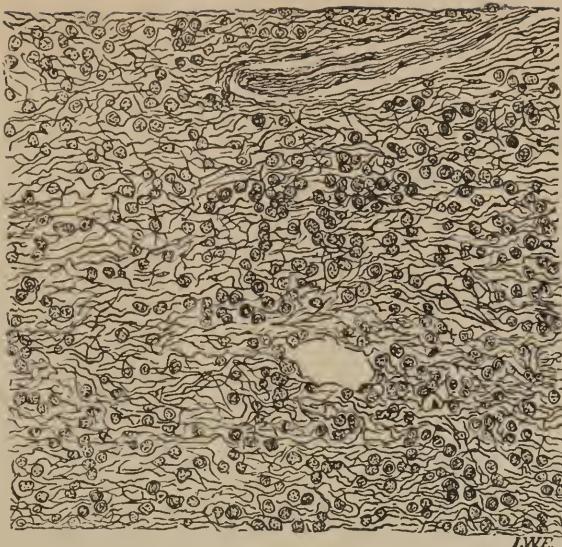


**ALVEOLAR SARCOMA (Large-celled).**

SYN., *Endothelial Carcinoma*.

From the interior (the fully developed) portion of the same growth, as represented in the preceding two figures. The alveoli have nearly altogether disappeared, and the characters of a large-celled sarcoma become prominent.  $\times 400$ .

Fig. 17.



L.W.E.

Fig. 18.



GLIOMA.

SYN., *Neuroglioma*.

Fig. 17. FROM CEREBRUM OF WOMAN AGED THIRTY.

Fig. 18. FROM PONS OF CHILD.

The characters of the brain-tissue (perivascular spaces of blood-vessels, etc.) are usually preserved in these essentially sarcomatous growths.  $\times 400$ .

Fig. 19.

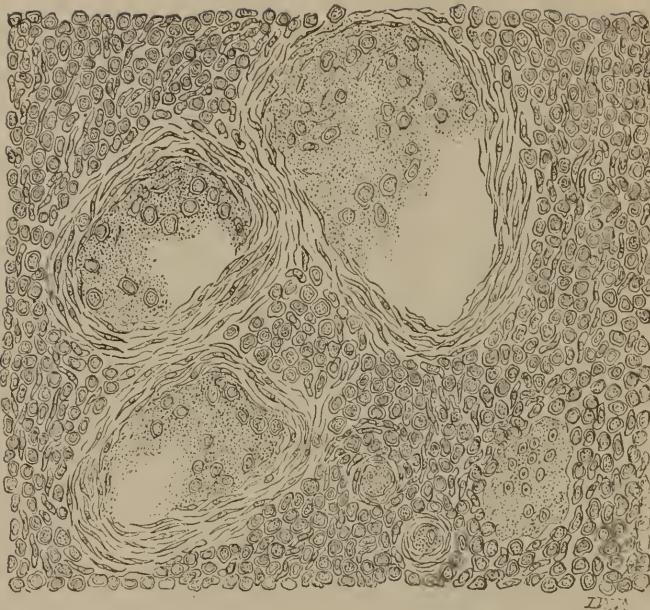
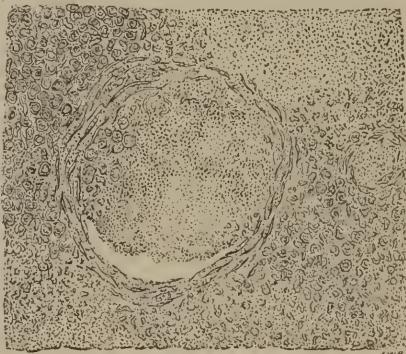


Fig. 20.



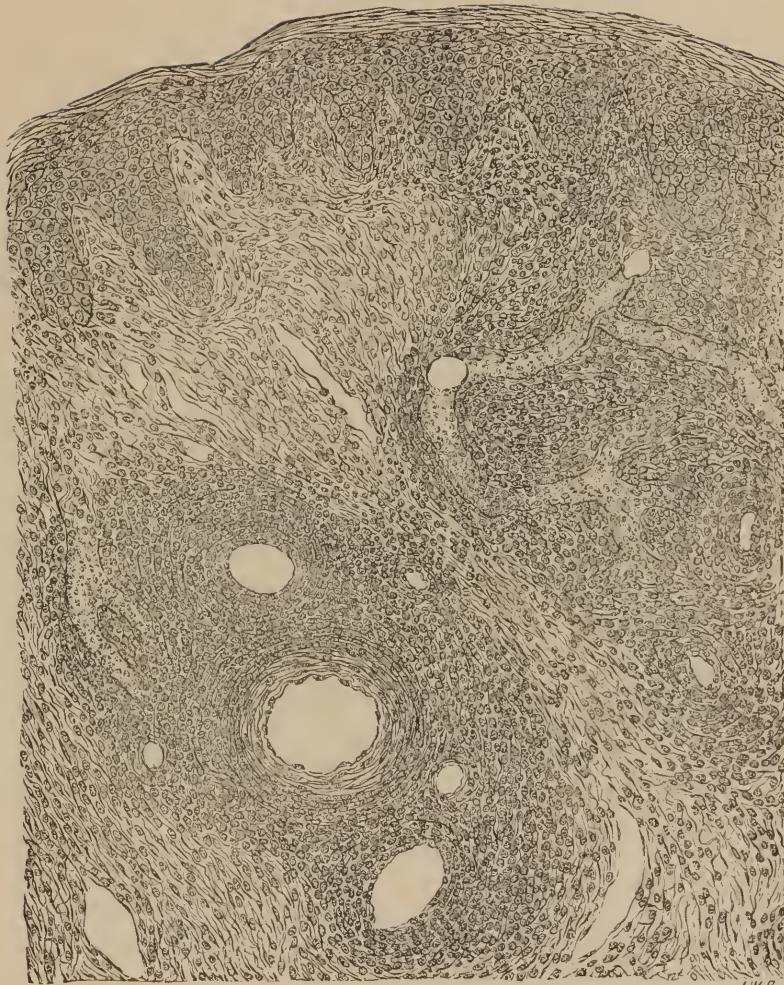
#### GUMMA.

SYN., *Syphiloma*.

Fig. 19. SECTION FROM THE PERIPHERAL PORTION OF A GROWTH FROM DURA MATER. A simple vascular granulation-tissue and a giant-cell are seen. As in all syphilitic new formations, or parts affected by this specific inflammation, the blood-vessel walls are made up of or surrounded by several dense layers of newly-formed spindle-shaped or, sometimes, round cells. The lumina of the vessels (the drawing shows in transverse section three large and two small blood-vessels) contain usually some cheesy material, cells, molecular débris, etc. The formation of small nodes is occasionally observed within the granulation-tissue.  $\times 400$ .

Fig. 20 represents a section from the central portion of the same gumous growth, showing well the complete cheesy change of all the elements. In the centre of the drawing is seen a transverse cut of an obstructed and degenerated vessel.

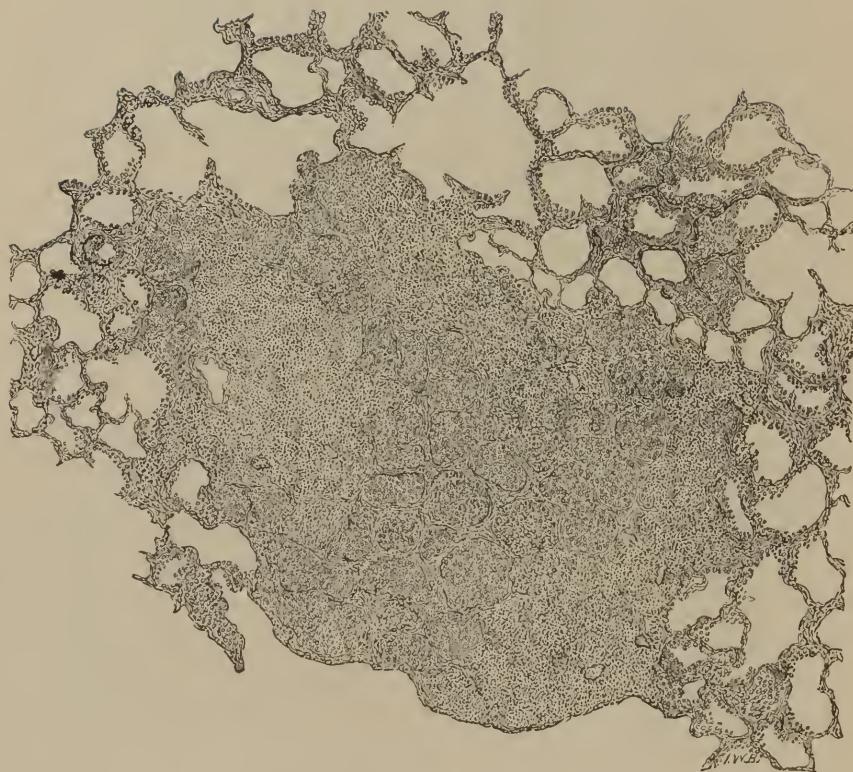
Fig. 21.



SYPHILITIC INDURATION OF SKIN.

Section through an indurated portion of a hard chancre. Subcutaneous tissue densely infiltrated by lymphoid cells as in any inflammatory condition. Peculiar to syphilis are, however, the unusual crowding and concentration of the infiltrate around the blood-vessels and in the walls of the latter, well shown in the drawing.  $\times 200$ .

Fig. 22.



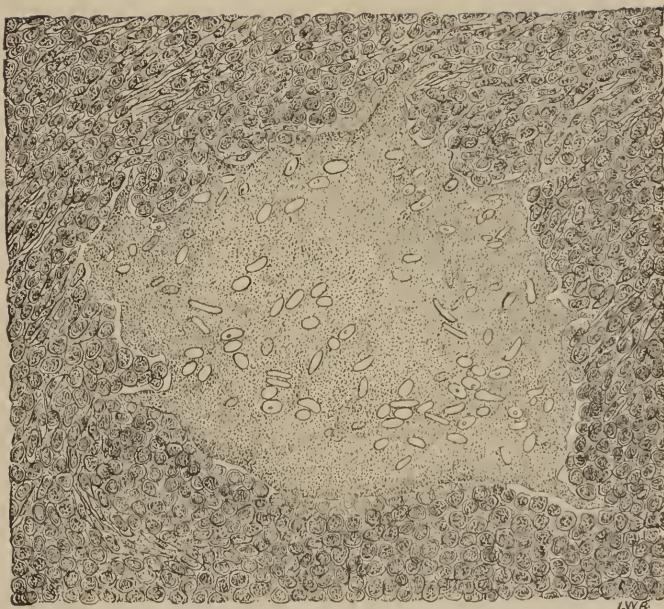
GRANULATION-TUBERCLE,

SIMULATING MILIARY TUBERCLE.

Section through a node (of size of pin's head) from a phthisical lung. The main bulk of the node is made up of air-vesicles (well seen in centre) filled with exudate; at the periphery of node some massive tubercle-granulations, with some giant-cells, are seen.  $\times 30$ .

Drawn from preparation of William H. Mercur.

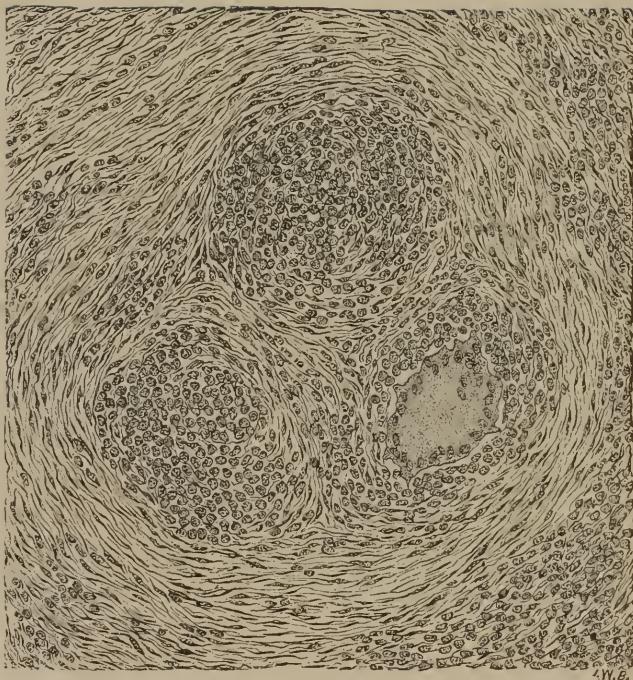
Fig. 23.



GIANT-CELL IN GRANULATION-TUBERCLE.

× 400. Drawn from Mercur's preparation.

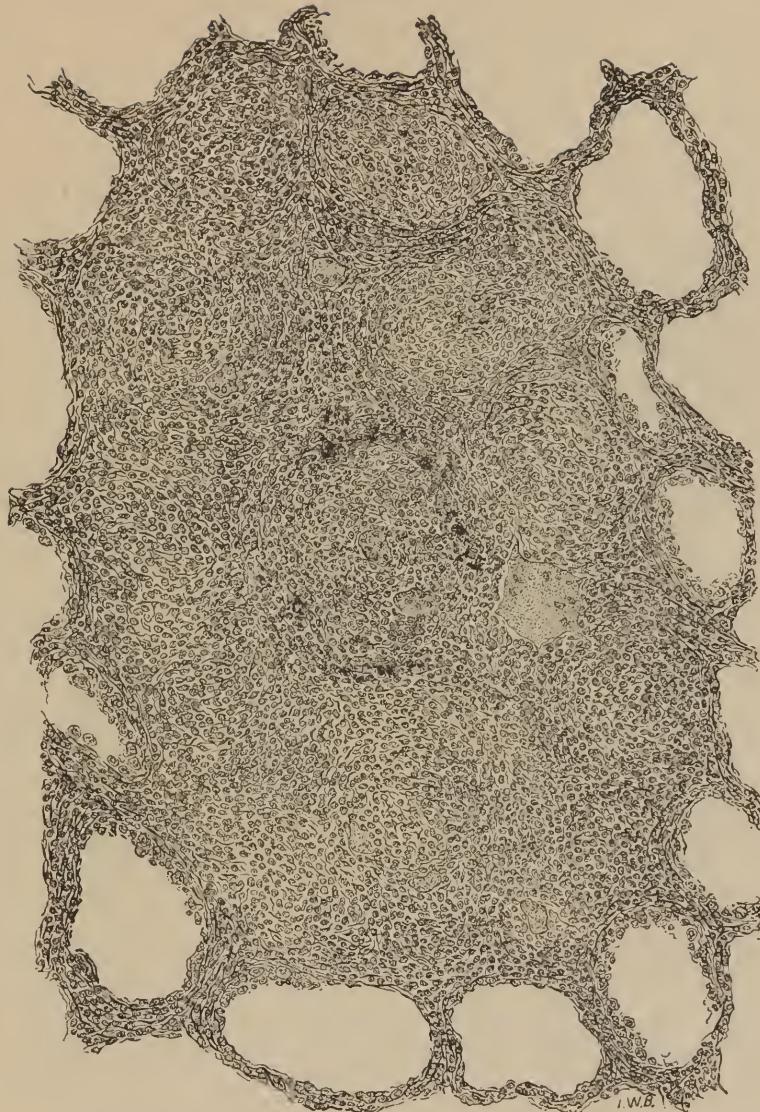
**Fig. 24.**



**MILIARY TUBERCLE,**

Showing fibroid change, from a case of plastic tubercular peritonitis. A giant-cell is seen in one of the sub-miliary tubercles.  $\times 200$ .

Fig. 25.

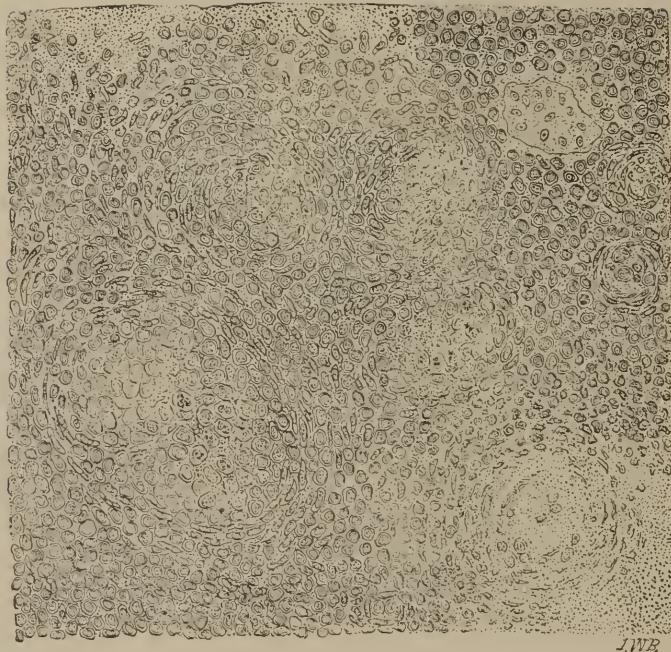


TUBERCLE-NODE

From lung in chronic phthisis, showing its origin from the organization of the exudate within the air-vesicles and the lumen of a bronchial; the latter is indicated by a ring of coal-dust. It is further seen that upon the size and the outlines of an individual acinus depend the size and shape of a tubercle-node. The outlines of the air-vesicles can be seen within the node by careful focusing. Giant-cells are also seen.  $\times 100$ .

Drawn from preparation of William H. Mercur.

Fig. 26.

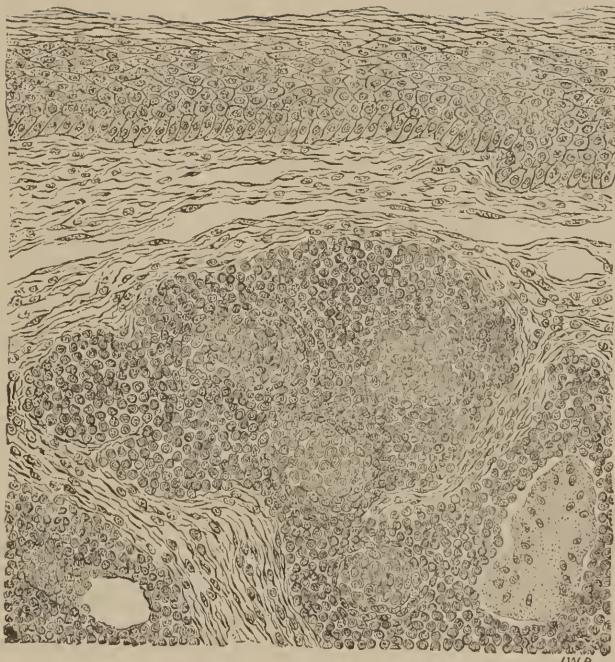


TYROMA.

SYN., *Tubercular Tumor, Solitary Tuberclle.*

Section from a tumor (size of walnut) of cerebellum of woman aged twenty. The arrangement of the cells into nodes, the obliteration of the blood-vessels, and the subsequent cheesy change in various degrees are well represented in the drawing.  $\times 400$ .

Fig. 27.



**LUPUS.**

Section through lobe of ear affected by lupus; early stage. (Case of Prof. Dulring, studied by Wile.) The growth is seen to start in the deeper portions of the cutis, growing upward and pushing the epidermis upward, but not affecting it. The initial formation of enormous giant-cells and the arrangement of cells into nodes are conspicuous features. The growth corresponds morphologically to tubercle, showing only less tendency to cicatrization, to obliteration of blood-vessels, and to cheesy change. It affects peculiarly the sebaceous glands, transforming them gradually (see Fig. 28) into huge pearly bodies, which easily drop out, leaving round, large holes.  $\times 200$ .

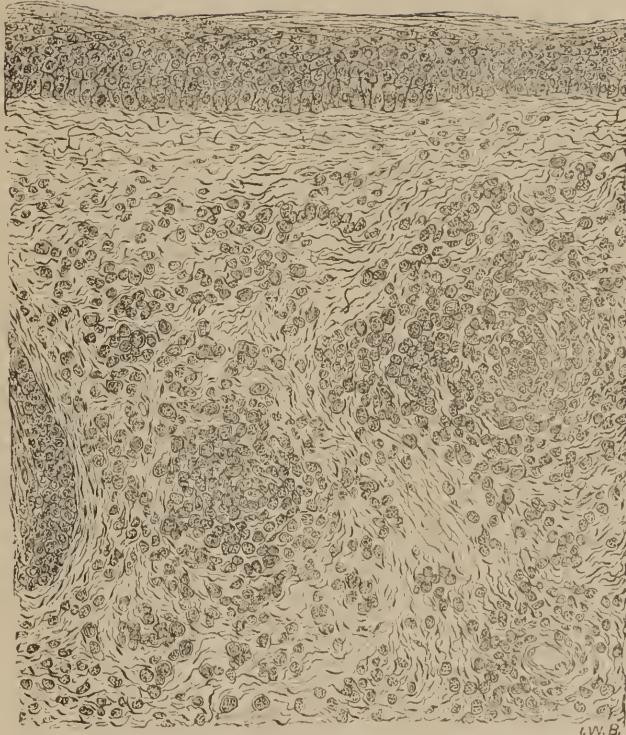
Fig. 28.



LUPUS.

Section viewed under low amplification. From same specimen as Fig. 27 (Prof. Duhring's case). See preceding description. The transformation of the sebaceous glands into pearly bodies is evident from this preparation.  $\times 50$ .

Fig. 29.



LEPROSY.

The section presents an early stage of this lesion, and shows it to be closely allied to lupus and tubercle.  $\times 200$ .

Drawn from preparation of Dr. Berman, of Baltimore.

Fig. 30.

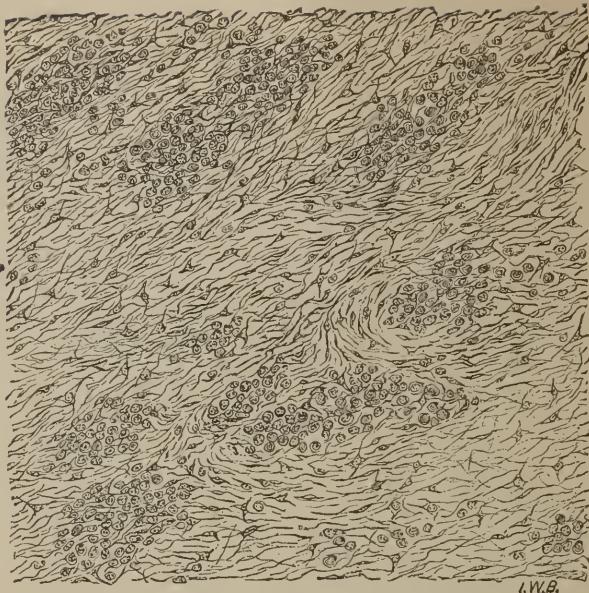
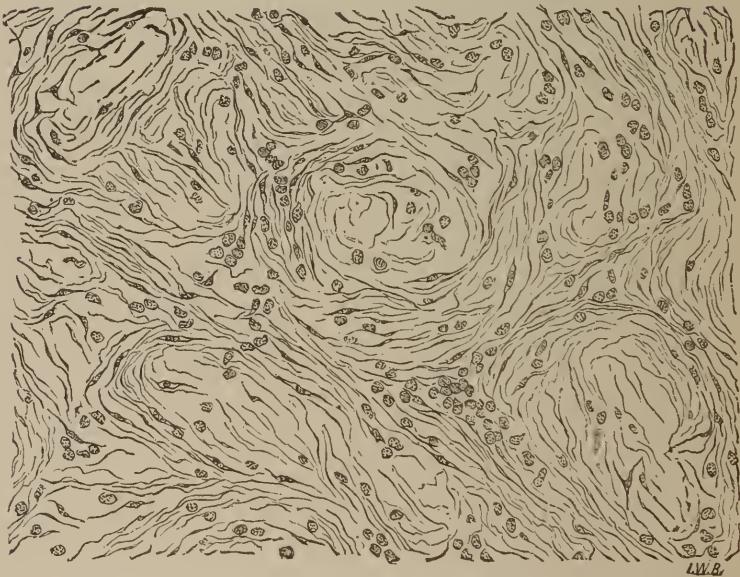


Fig. 31.



FIBROMA (Soft).

Fig. 30. SOFT FIBROMA OF UTERUS (INTRAMURAL). The connective tissue is mainly of the areolar (reticular) variety, rich in young cells; the latter form smaller and larger groups. Some delicate fibrillar tissue fills the interspaces formed by the union of stellate cells.

Fig. 31. FIBROMA OF SCROTUM. The fibrillar bundles are indicated by mere outlines; the fibrils composing them are not represented, being hardly perceptible, on account of their thinness and resistance to staining fluids, presenting a hyaline, transparent appearance. Numerous young cells (proliferated endothelial cells) are seen between and around the fibrillar bundles. No yellow elastic tissue is found in the fibromata.  $\times 300$ .

Fig. 32.

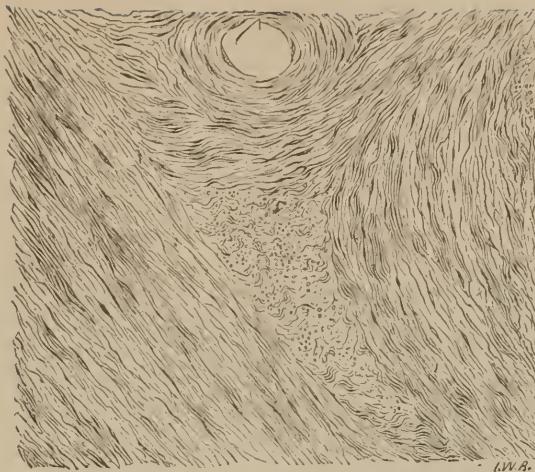


Fig. 33.

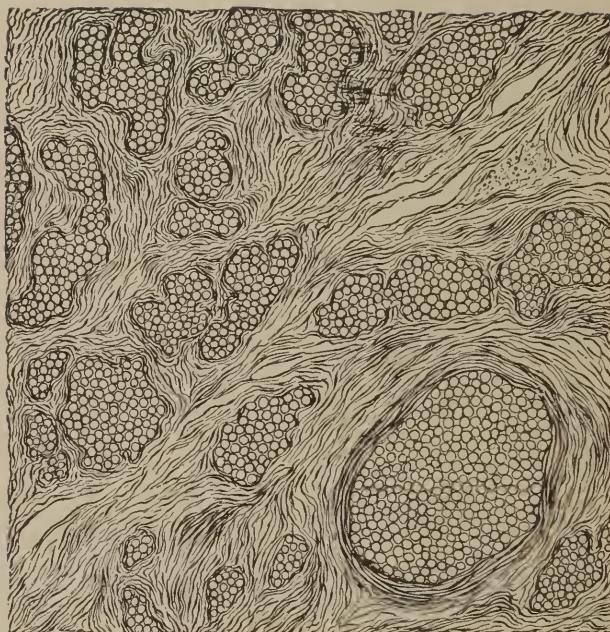


#### FIBROMA (Hard).

Fig. 32. HARD FIBROMA (developed from fascia of thumb). The dense fibrillar connective-tissue masses, of which the tumor is made up exclusively, decussate in various directions. In the middle of the drawing is seen a cone-shaped area representing transverse cuts of fibres. The upper portion shows a blood-channel without walls, and around it the fibres are arranged concentrically.  $\times 300$ .

Fig. 33. FIBROMA MAMME. The fibrillar connective tissue appears loose and wavy. In several places transverse cuts of bundles of fibres are seen. In the upper portion of the drawing a milk-duct is seen in transverse section with its lining epithelium somewhat proliferated.  $\times 300$ .

Fig. 34.



CAVERNOUS FIBROMA.

Syn., *Cavernous Angioma, Telangiectatic Fibroma.*

Section from fibroma of uterus undergoing cavernous change,—i.e., a bloody infiltrate. The alveoli seen in the section between the fibrillar bundles represent transverse sections of lymph-spaces and of blood-channels, all distended by blood.  $\times 300$ .

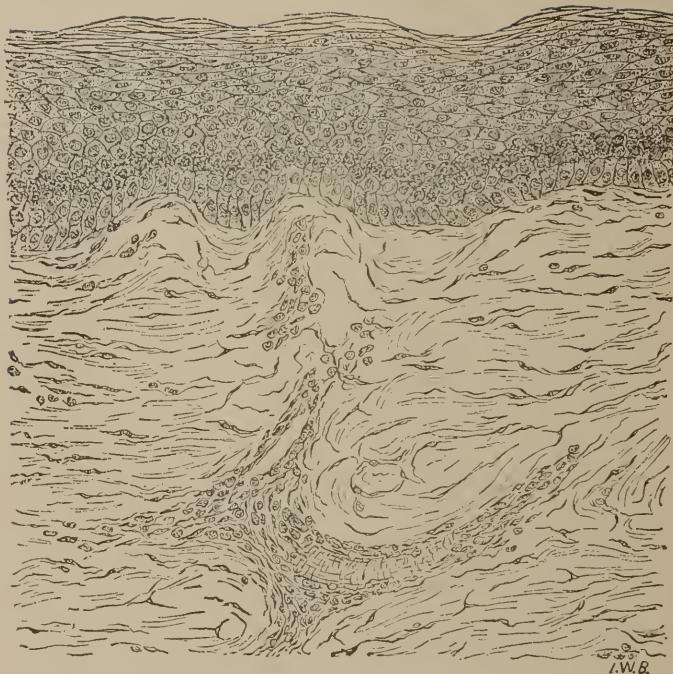
Fig. 35.



ELEPHANTIASIS ARABUM.

Section from deeper portion of cutis (which measured one inch in thickness) of foot. Widely-distended lymph-spaces, distended by lymphoid cells and fatty granules, and the isolated tortuous bands of yellow elastic tissue, are seen in the dense fibrillar matrix.  $\times 300$ .

Fig. 36.



KELOID.

SYN., *True Keloid, Nævus, Congenital Scar.*

Section of a congenital flat tumor (about one inch in diameter) from neck of young woman. Dense, scar-like fibrillar connective tissue substitutes all the elements of the normal cutis (such as hair, glands, nerves, yellow elastic tissue, etc.). The fibrils are hardly perceptible, being very dense and transparent, simulating mucous tissue. A branching arteriole seen with adventitia infiltrated by young cells.  $\times 300$ .

Fig. 37.



Fig. 38.

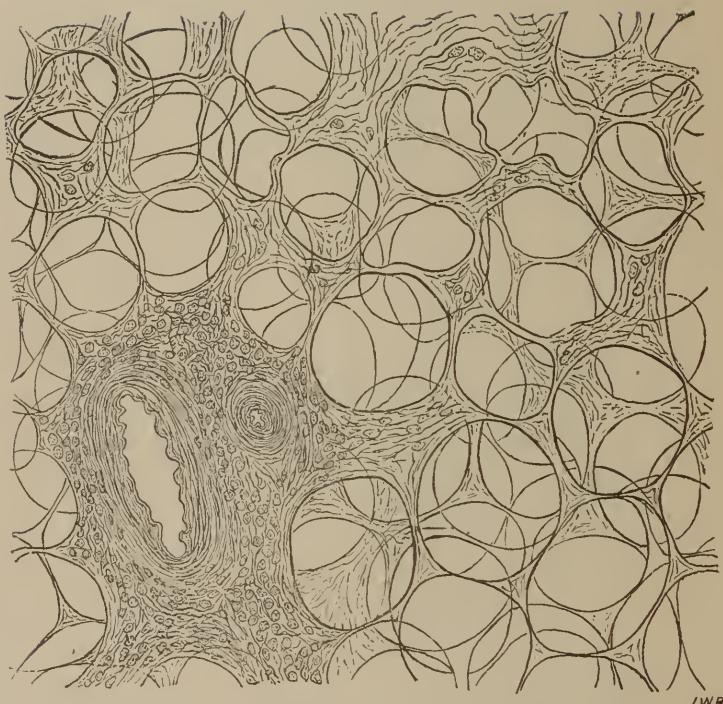


**LIPOMA AND NORMAL ADIPOSE TISSUE. (Low Amplification.)**

Fig. 37. LIPOMA (from subcutaneous tissue of hip). Only fat-vesicles and connective-tissue bands traversing in various directions between them, producing the appearance of lobules, are seen.  $\times 40$ .

Fig. 38. NORMAL SUBCUTANEOUS ADIPOSE TISSUE. Showing the lobules formed by the fat-vesicles, and the latter themselves to be of smaller size than in the lipoma. In addition, it shows a nerve-trunk and well-organized blood-vessels (in transverse section).  $\times 40$ .

Fig. 39.



ADIPOSE TISSUE. (High Amplification.)

× 300.

I.W.B.

Fig. 40.



MYXOMA.

Section of a large myxomatous tumor of peritoneum. Stellate, spindle-shaped, and roundish cells, mostly free, are embedded in a homogeneous, translucent, semi-liquid matrix (the latter is represented in the drawing by the finely-granular background). Bands of connective tissue containing blood-channels ramify throughout the tissue. Occasionally, yellow elastic fibres are seen.  $\times 300$ .

Fig. 41.

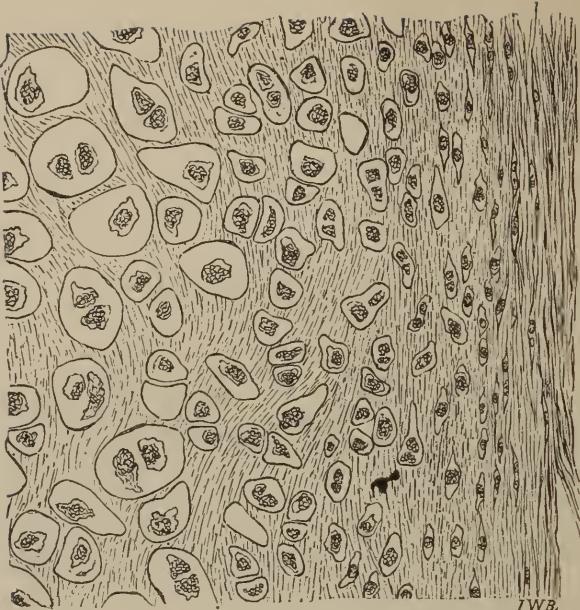
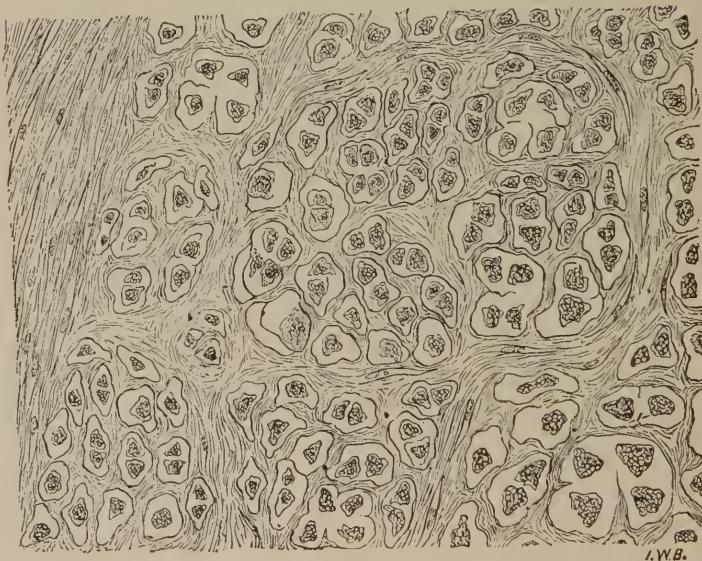


Fig. 42.



#### CHONDROMA.

SYN., *Enchondroma, Cartilaginous Tumor.*

Fig. 41. CHONDROMA (OF TESTIS), HYALINE VARIETY. The gradual transition of simple fibrous tissue (right side of cut) into cartilaginous tissue (left side) is well demonstrated. The matrix is faintly but quite noticeably fibrillated, and the spaces in which the cartilage-cells lie are very large.  $\times 300$ .

Fig. 42. CHONDROMA (OF KNEE-JOINT), ALVEOLAR VARIETY. The matrix is made up of fibrillar tissue (probably fibro-cartilage), which surrounds groups of cells, and is seen also between the cells, giving rise to an alveolar appearance.  $\times 300$ .

Fig. 43.



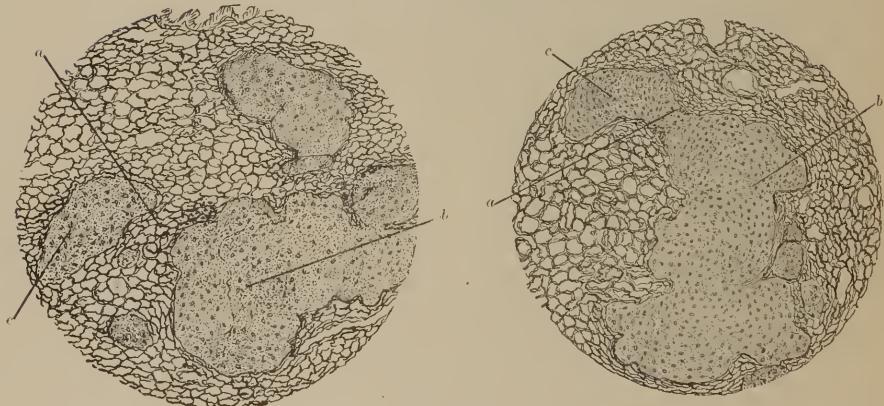
MYXOMATOUS CHONDROMA.

A combination tumor (of thyroid gland) made up of cartilaginous and myxomatous tissue; it represents a mucoid degeneration of a chondroma. In the corner of the drawing is seen a plexus of capillaries,—a very constant appearance in these growths. The finely-granular background is intended to represent the nearly perfectly structureless, hyaline matrix.  $\times 300$ .

Fig. 44.



Fig. 44a.



OSTEOMA.

Fig. 44. Section from a large exostosis of femur, which showed evidence of an old healed fracture; Haversian canals were observed to run in most varying directions.  $\times 200$ .

Fig. 44a. Bony nodes in lung of dog, developed from periosteum introduced by means of jugular vein. (After Henry Wile.)  $\times 15$ .

Fig. 45.

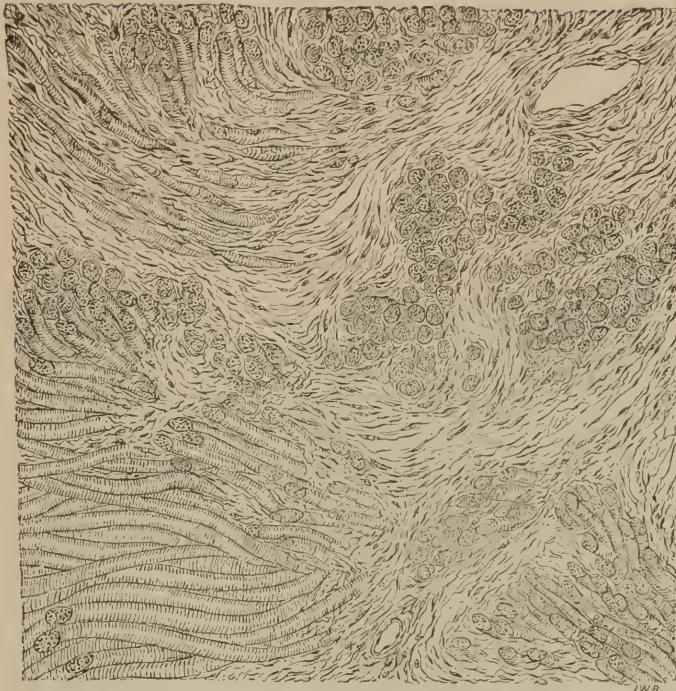
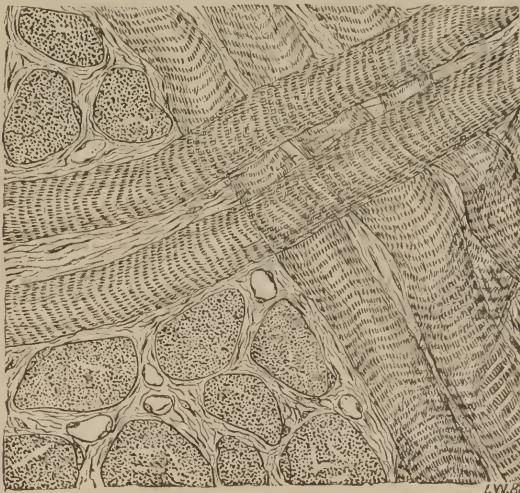


Fig. 46.

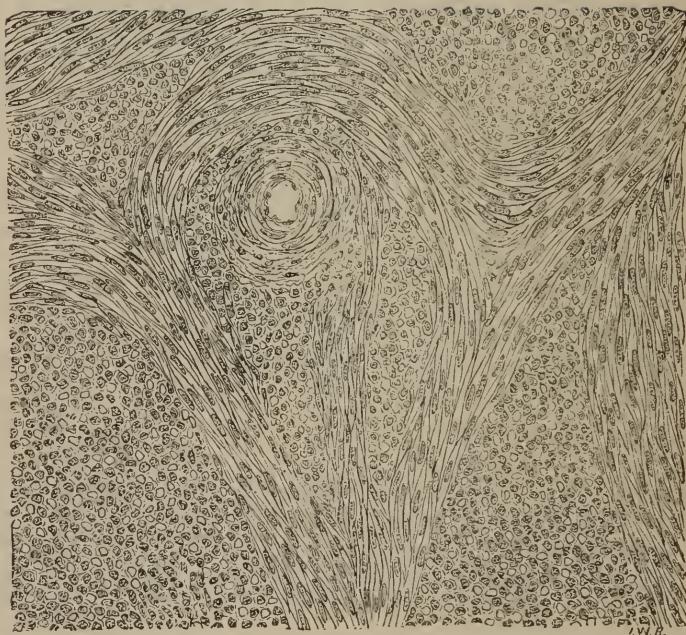


RHABDO-MYOMA.

Fig. 45. RHABDO-MYOMA, LARGE TUMOR OF KIDNEY OF NEW-BORN CHILD. Striated muscular fibres (not exceeding one-quarter of thickness of the skeleton muscular fibres) are interlacing within the connective-tissue matrix, and are viewed in transverse and oblique cut, and also longitudinally.  $\times 300$ .

Fig. 46. Section through muscular substance of human tongue, to show, under the same amplification, the comparative size of the muscular fibres, both transverse cuts and longitudinally.  $\times 300$ .

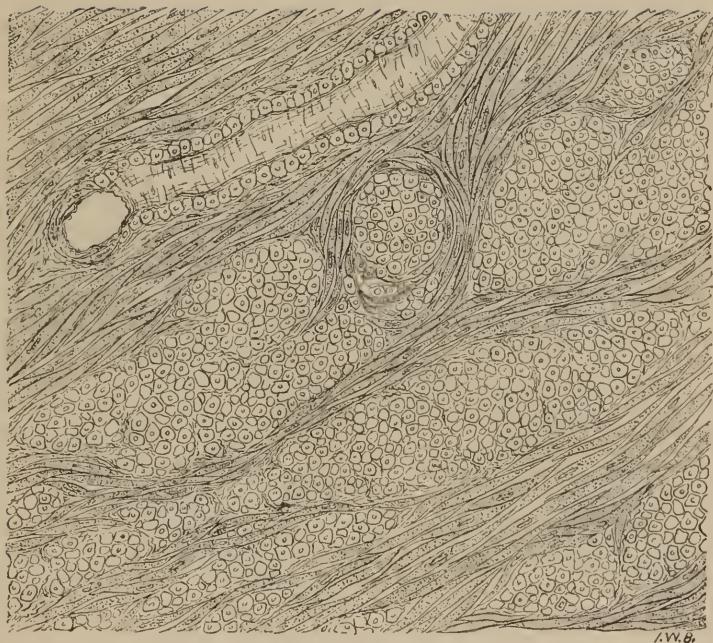
Fig. 47.



LEIO-MYOMA.

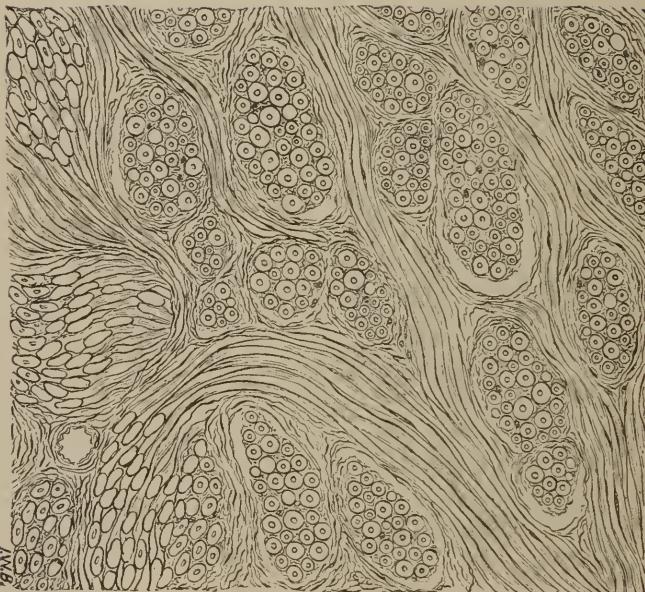
LEIO-MYOMA (from neck of uterus). The smooth (unstriated or organic) muscular cells which exclusively, or intermingled with a small amount of connective tissue, compose this tumor are seen arranged into fascicular cords, which interlace in varying directions, sometimes circularly around blood-channels. The drawing shows a transverse section of a vessel, as well as the spindle-shaped muscular cells, both longitudinally and in cross-section; the angular appearance of the latter is noticeable.  $\times 300$ .

Fig. 48.



NORMAL SMOOTH MUSCULAR TISSUE OF UTERUS. The cells are larger and the nucleus smaller than in the cells of myoma (Fig. 47); seen also both longitudinally and in cross-section. The latter may be mistaken for epithelial cells. An arteriole is seen in the upper portion of the drawing.  $\times 300$ .

Fig. 49.

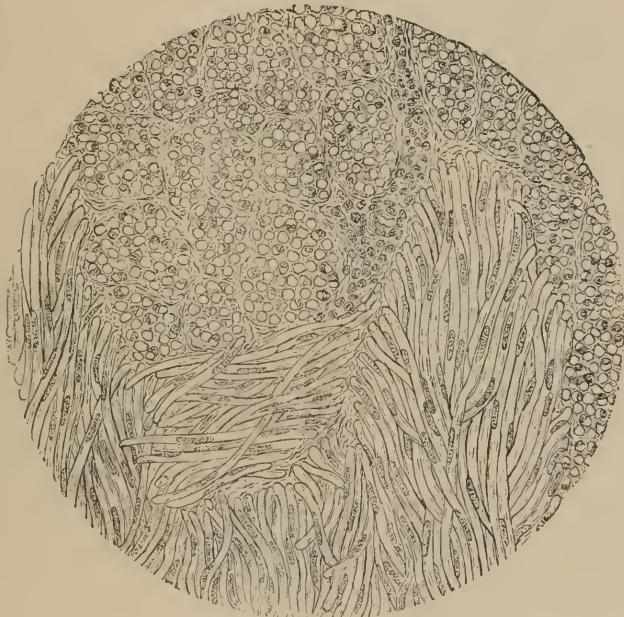


MEDULLATED NEUROMA.

SYN., *Myelinic Neuroma, Amputation Neuroma, True Neuroma.*

Section of painful neuroma of femur, developed as a nodular formation at cut end of sciatic nerve. The medullated nerve-fibres, with a small amount of connective tissue between them, interlace in bundles, and are seen cut in various directions. The transverse sections are always round, and show well the axis-cylinders.  $\times 300$ .

Fig. 50.



NON-MEDULLATED NEUROMA.

SYN., *Am gelinie Neuroma.*

PAINFUL NEUROMA OF SKIN (DUHRING).

The growth is nearly exclusively made up of non-medullated nerve-fibres. The lateral position of nuclei is quite conspicuous in both transverse section and the longitudinal view of the fibres.  $\times 300$ .

Drawn after a preparation of Dr. De Schweinitz, from case recorded by Prof. Duhring.

Fig. 51.

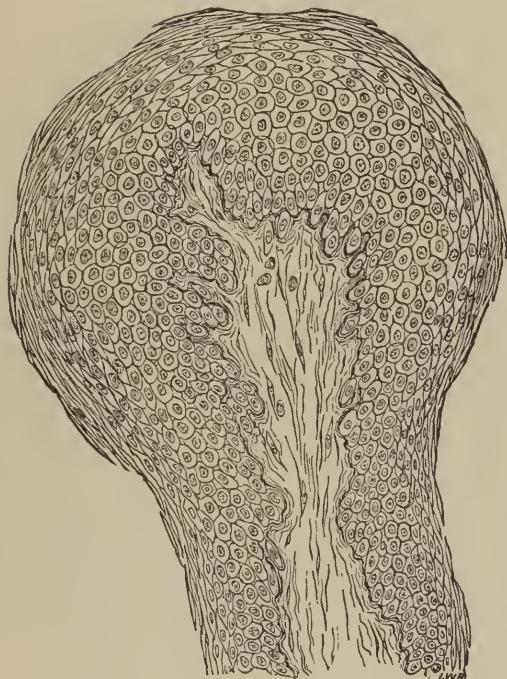


**HARD PAPILLOMA. (Low Amplification.)**

SYN., *Villous Tumor, Condyloma.*

Section through a portion of a warty growth of prepuce, exhibiting well the dendritic (cauliflower) appearance.

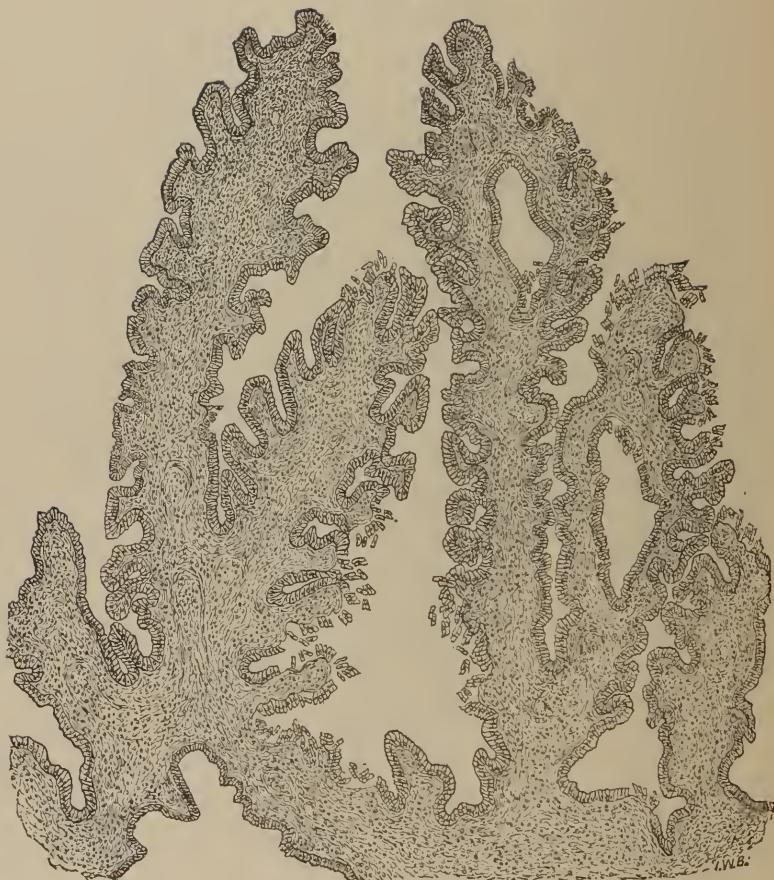
Fig. 52.



**HARD PAPILLOMA. (High Amplification.)**

Section through tip of one of the warty vegetations represented in preceding figure (51). The whole growth is made up of branching connective-tissue vegetations (overgrown papillæ), which are capped by cuboidal and squamous stratified epithelium.  $\times 200$ .

Fig. 53.

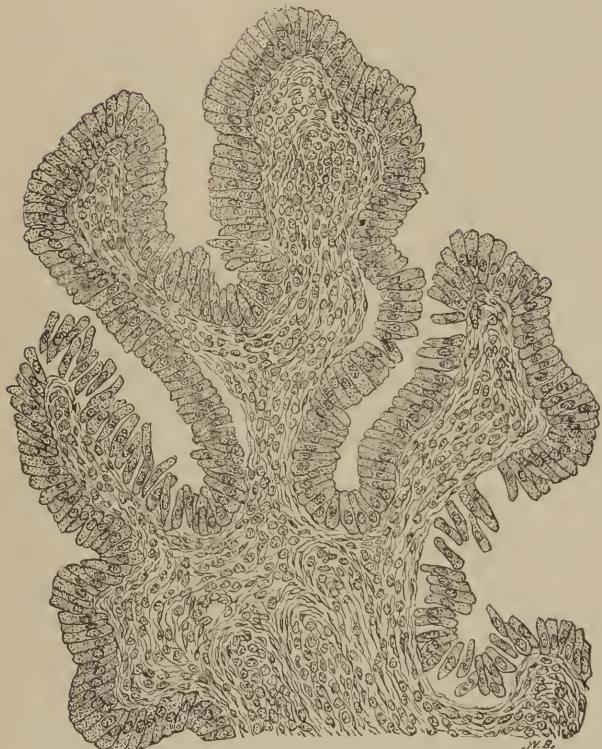


SOFT PAPILLOMA.

SYN., *Soft Villous Tumor, Cauliflower Vegetation.*

Section through a part of a villous growth of neck of urinary bladder, showing a branching connective-tissue vegetation capped by a single layer of columnar epithelial cells.  $\times 100$ .

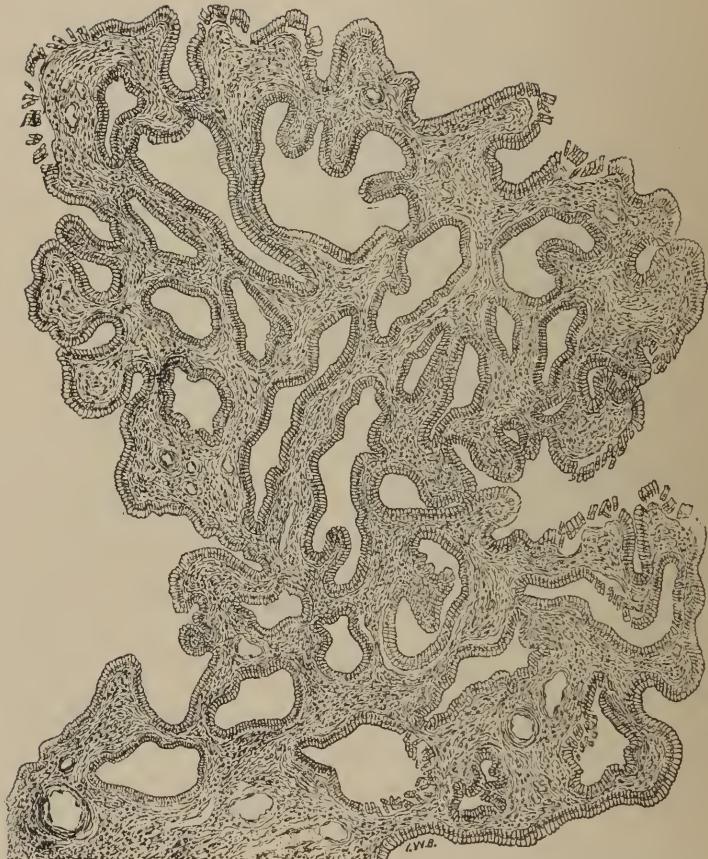
Fig. 54.



SOFT PAPILLOMA.

A small fragment from the tip of the same villous growth as represented in Fig. 53, viewed under higher magnifying power.  $\times 250$ .

Fig. 55.

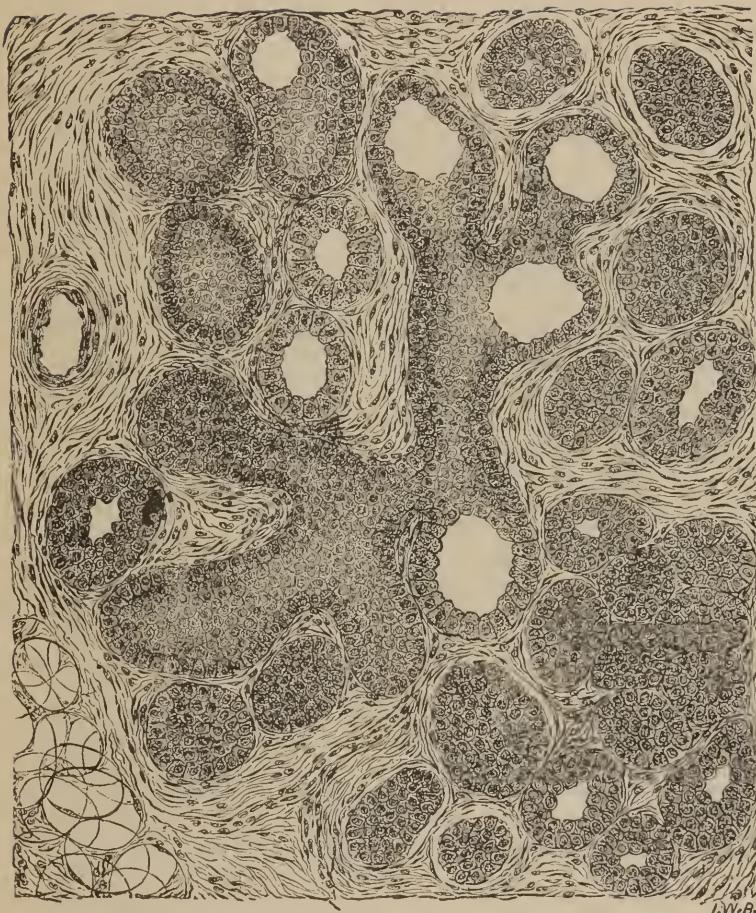


CYSTIC PAPILLOMA.

SYN., *Papillary or Papillomatous Adenoma, Villous Vegetations.*

Section through a fragment of a uterine vegetation. Closely allied to the benign structures (papillomata) represented in the preceding four figures; shows, in addition, cystic formations within the vegetations, and ingrowth of the papilla.  $\times 100$ .

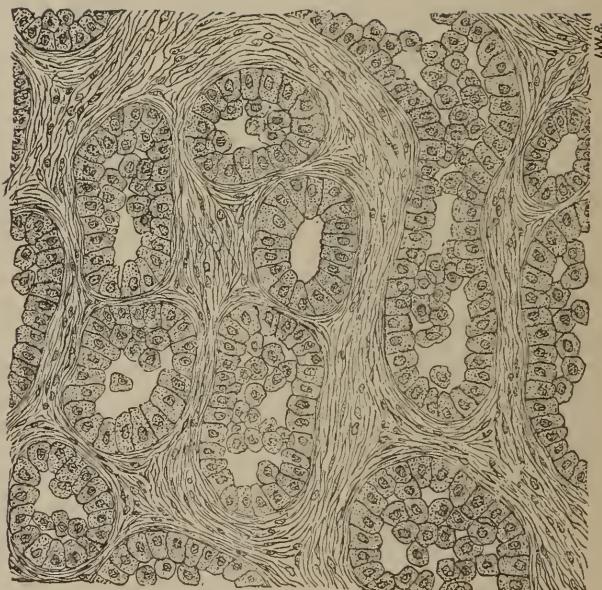
Fig. 56.



ADENOMA MAMMÆ.

Section through an acinus of newly-formed (outgrown) racemose glandular tissue. Some of the ducts and their racemose blunt-pointed endings appear separated in transverse section, their connection with the main duct in the middle being cut away. The cuboidal epithelium of the ducts, as well as in the racemose endings, rests everywhere upon a basement membrane. The more distal ends of the ducts are completely filled with epithelium. The same is the case with the normal mammary gland, for which this drawing may serve as a fair representation.  $\times 200$ .

Fig. 57.



ADENOMA.

Cross-section through the more tubular portion of an adenoma. The epithelial cells are here higher (more cylindrical) than in the racemose portions, where the cells are sometimes nearly flat, squamous, and quite small.  $\times 200$ .

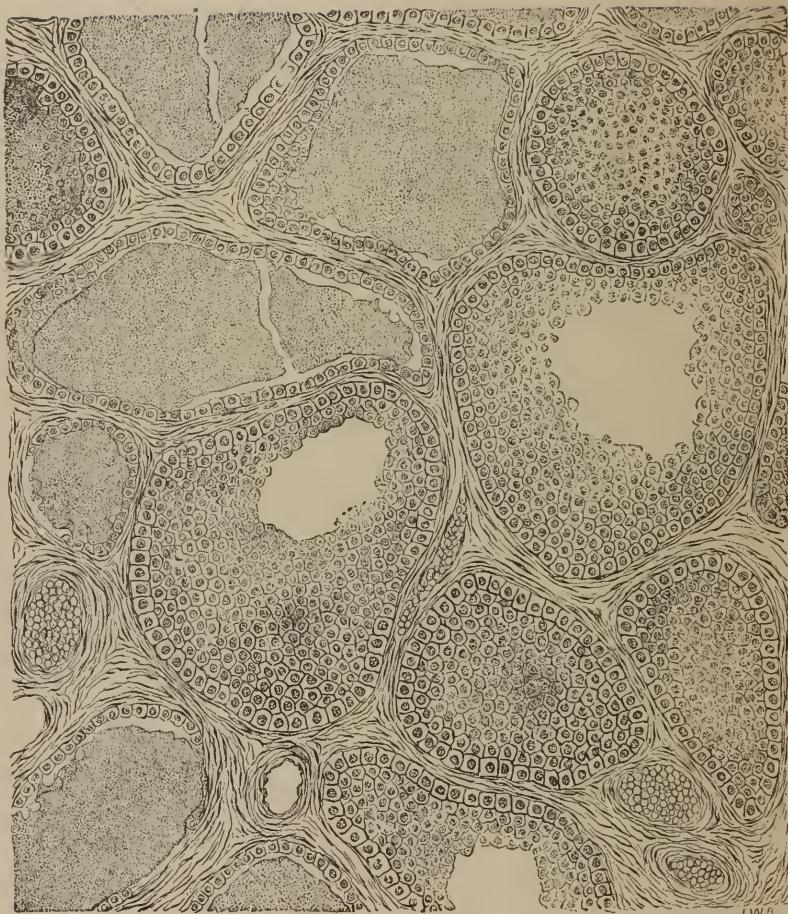
Fig. 58.



CYSTIC COLLOID ADENOMA.

Section of a colloid tumor of mammary gland. The glandular acini have undergone cystic change. The walls of the cysts are lined with a non-stratified high cylindrical epithelium, as are also the numerous villous outgrowths which proceed from them. Some of the attenuated septa of the cysts appear to be lined by a fine mosaic, which represents masses of columnar cells viewed from the top. The cysts are mostly filled with colloid material, the homogeneous appearance of which is not successfully represented in the cut.  $\times 100$ .

Fig. 59.



GOITRE.

SYN., *Struma, Hypertrophy of Thyroid Gland.*

Section of a greatly enlarged thyroid gland. The structure does not differ materially from that of a normal thyroid, except that the racemose vesicles, which have a beautiful mosaic of cuboidal cells (well seen by focusing), are larger and show more colloid matter than usual.  $\times 250$ .

Fig. 60.



CARCINOMATOUS ADENOMA MAMMÆ.

SYN., *Acinous Adenoma*.

The epithelial cells of the racemose portion of the gland are actively proliferating, and begin to lose their defined relation to the basement membrane, the growth thus acquiring a malignant character.  $\times 250$ .

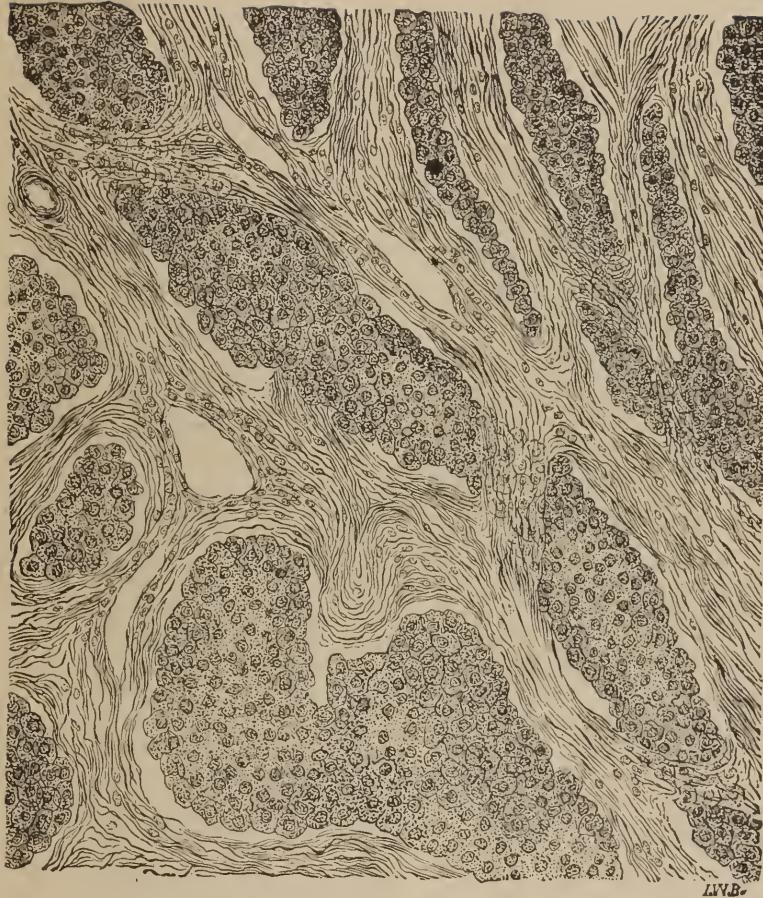
Fig. 61.



DEVELOPMENT OF CARCINOMA.

ADENOMA MAMMÆ, showing transformation into true cancer. The direct origin of the cancer-cylinders (lower right part of drawing) from the epithelium of the normal glandular ducts (upper part), through destruction of the basement membrane, is well demonstrated in this section. Around the blood-vessels is seen a lymphoid infiltrate, which contributes to the growth of the fibrous constituents of the tumor. After studies of E. G. Matson and Carl H. Reed.  $\times 250$ .

Fig. 62.



**HARD CARCINOMA.**

SYN., *Hard Cancer, Scirrhous*.

Section from fully-developed outer portion of a hard cancer of mammary gland, showing the alveolar connective-tissue frame-work to be filled with loose, *continuous* epithelial cell-masses (cancer-cylinders). Careful examination further shows the dependence of the alveolar appearance of cancer upon the transverse and oblique section of the connective-tissue lymph-spaces, which are filled by the intruding epithelial cells.  $\times 250$ .

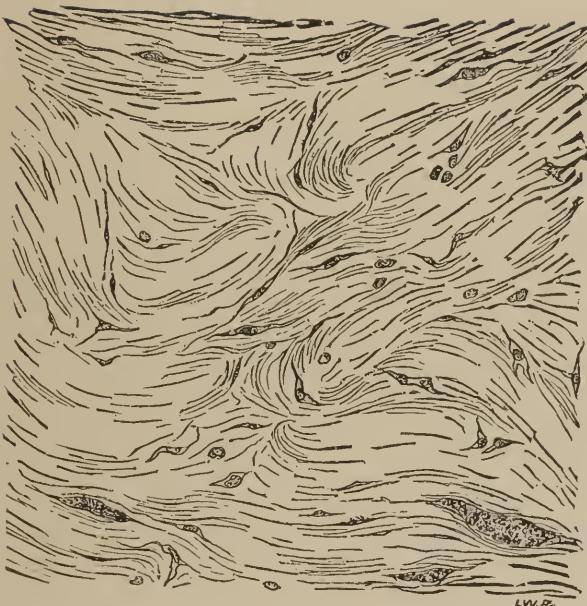
Fig. 63.



HARD CARCINOMA MAMMÆ.

Section taken from a more central part of the same tumor as that of the preceding figure (62). The overgrowth of a dense, massive connective tissue is seen to exert great pressure upon the cancer-cylinders, inducing their atrophy, and leading to a central cicatrization of the cancer.  $\times 250$ .

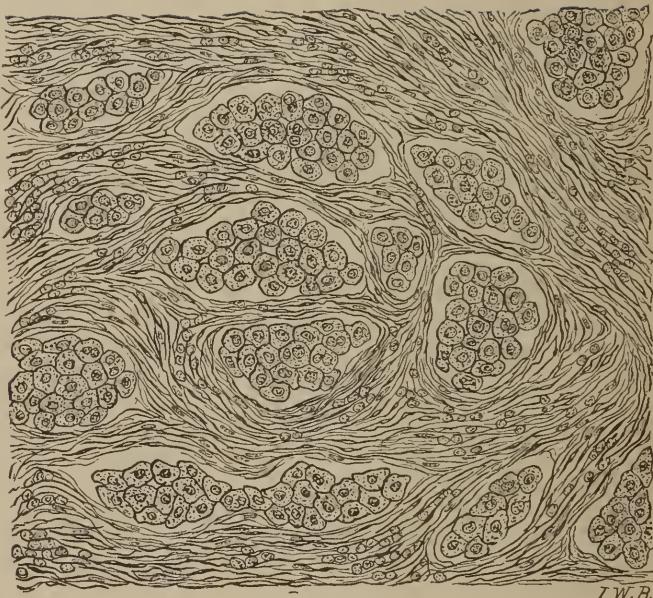
Fig. 64.



CICATRIZATION OF HARD CARCINOMA.

Section through central portion of a hard cancer. The scar-like connective tissue, which exclusively composes this portion of the growth, is made up of densely-packed, transparent fibres, which do not well take staining, and hence present a nearly hyaline appearance. In the lower portion of the drawing some remnants of atrophied cancer-cylinders are seen; endothelial cells are seen between the faintly-indicated fibrillar bundles.  $\times 250$ .

Fig. 65.

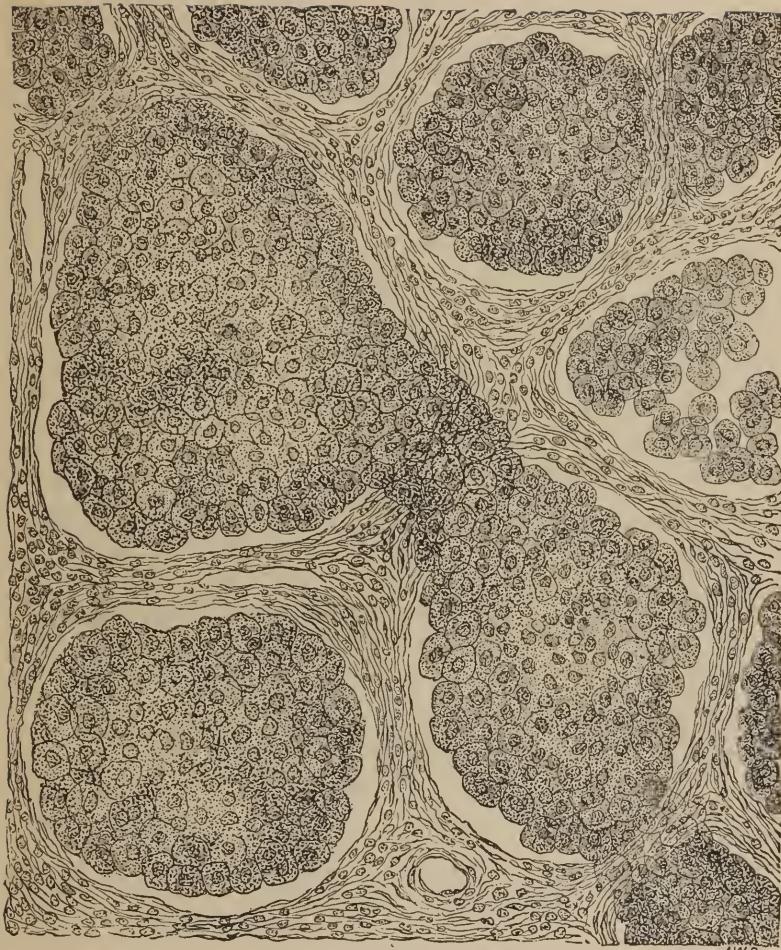


Z.W.B.

CARCINOMA OF UTERUS.

The cancer-cylinders are seen mainly in transverse section (this gave rise to the cancer-nests of authors); they invade the lymph-spaces between the muscular tissue, the latter, in this case, forming the alveoli.  $\times 300$ .

Fig. 66.



**SOFT CARCINOMA.**

SYN., *Soft Cancer, Encephaloid, Medullary Cancer.*

Section of a large, soft mammary cancer. The cancer-cylinders are very voluminous and of thick calibre, lying loose in the widely-distended lymph-spaces. In transverse section this gives rise to the large alveoli peculiar to this growth. No attempt at cicatrization can be discovered in any part of the soft cancer, and the cells show strong tendency to fatty degeneration.  $\times 250$ .

Fig. 67.



SOFT CARCINOMA.

Section of a soft cancer which showed much milky juice and sloughing. Rapid fatty degeneration of the epithelium composing the cancer-cylinders is seen. In the drawing is represented a circumscribed cheesy nuss within the fatty degenerating cancer-cylinder; this is a common appearance in soft cancer. The connective tissue is infiltrated by leucocytes.  $\times 250$ .

Fig. 68.



Fig. 69.



#### VARIOUS APPEARANCES OF SOFT CANCER.

Fig. 68. SOFT CARCINOMA, SIMULATING ALVEOLAR SARCOMA. The cells, however, have no inter-cellular substance, they undergo fatty degeneration, and are easily removed by brushing.

Fig. 68. SOFT CARCINOMA. Cells are very indistinct, and many "cancer-nests" are empty.

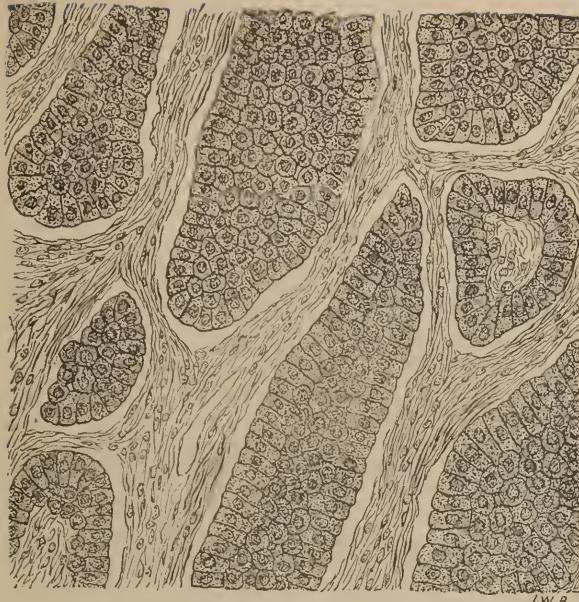
Fig. 70.



CARCINOMATOUS OSTEOMA MAMMÆ.

Section of a mammary (encapsulated) bony tumor (case of Prof. S. W. Gross), showing secondary cancerous change in an ossifying adenoma.  $\times 250$ .

Fig. 71.



I.W.B.

Fig. 72.



I.W.H.

SURFACE CANCERS.

SYN., *Epithelioma*.

Fig. 71. CYLINDRICAL EPITHELIOMA OF PYLORIC END OF STOMACH.

Fig. 72. TUBULAR EPITHELIOMA OF NARES.

A few small pearly bodies are seen within the cancer-cylinders.  $\times 300$ .

Fig. 73.

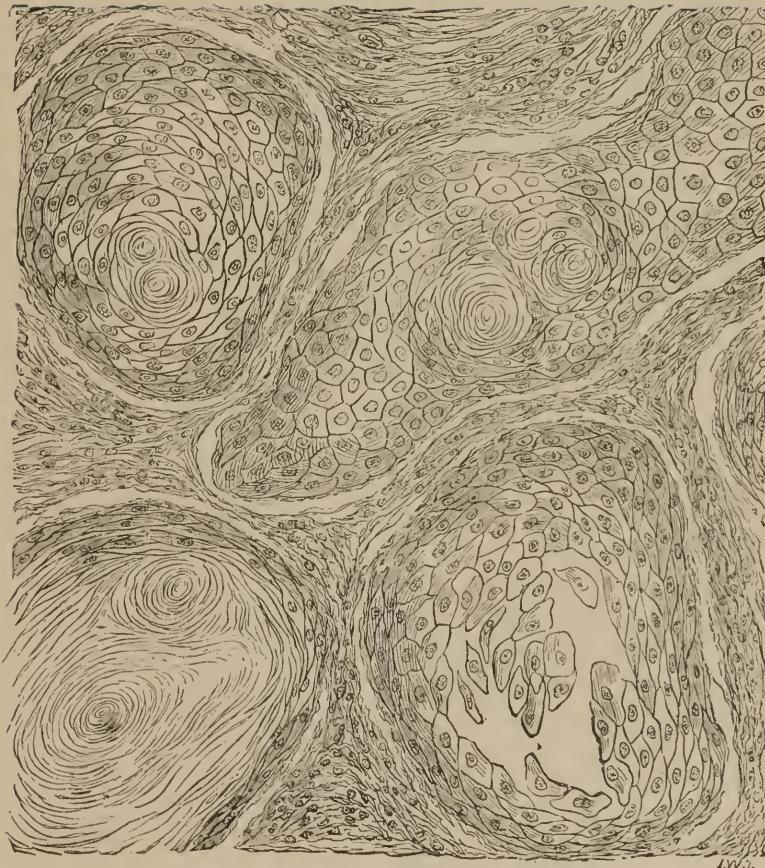


SQUAMOUS EPITHELIOMA. (As seen under Low Amplification.)

Syn., *Carcinoid Epithelial, or Epidermal Cancer.*

Section through a cancerous (rodent) ulcer of skin of foot of young man. The right part of the drawing shows normal skin with gradually developing cancer-cylinders. These, taking their departure from the inter-papillary deeper portion of the epidermis, penetrate downward into the cutis and the subcutaneous tissue. Numerous pearly bodies are seen in the epithelial cylinders.

Fig. 74.



**SQUAMOUS EPITHELIOMA.**

The drawing represents, under high amplification, a small portion of the same specimen as represented in preceding figure (73). It exhibits the composition and the different appearances of the pearly bodies.  $\times 200$ .





